



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/821,361	03/29/2001	Noriaki Sakamoto	10417-074001	3784

26211 7590 08/09/2005

FISH & RICHARDSON P.C.  
CITIGROUP CENTER 52ND FLOOR  
153 EAST 53RD STREET  
NEW YORK, NY 10022-4611

EXAMINER
----------

CHU, CHRIS C

ART UNIT	PAPER NUMBER
----------	--------------

2815

DATE MAILED: 08/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

**Office Action Summary**

Application No.

09/821,361

Applicant(s)

SAKAMOTO ET AL.

Examiner

Chris C. Chu

Art Unit

2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 May 2005.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 4, 10 and 13 - 28 is/are pending in the application.
- 4a) Of the above claim(s) 10, 13 - 22 and 24 - 27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 4, 23 and 28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 March 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Response to Amendment***

1. Applicant's amendment filed on May 23, 2004 has been received and entered in the case.

### ***Drawings***

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the following limitation in claim 4 "wherein the rear surface of at least one bridge is recessed relative to the rear surface of an insulating resin; and wherein the rear surface of the at least one bridge is covered by an insulating film" must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an

Art Unit: 2815

application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

*Claim Rejections - 35 USC § 112*

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 4, 23 and 28 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

(A) In claim 4, the specification fails to describe the limitation "wherein the rear surface of at least one bridge is recessed relative to the rear surface of an insulating resin". Since the final product of this invention clearly shows in Fig. 1C that the rear surface of the bridge is same level with the rear surface of the insulating resin, hence the new limitation "wherein the rear surface of at least one bridge is recessed relative to the rear surface of an insulating resin" in the claim 4 is not supported by the specification in such a way to reasonably convey to one

Art Unit: 2815

skill in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention.

- (B) Dependent claims 23 and 28 do not rectify the deficiency of claim 4 and therefore are similarly rejected.

*Claim Rejections - 35 USC § 103*

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 4 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al. (U.S. Pat. No. 5,273,938) in view of Sawaya (U. S. Pat. No. 5,352,632).

Regarding claim 4, Lin et al. discloses in e.g., Fig. 3 a semiconductor device comprising:

- a first (17) and a second (15) semiconductor chip which are electrically connected to each other (column 3, lines 25 – 27);
- a first die pad (19 under the element 17) to which said first semiconductor chip is fixed;
- a second die pad (19 under the element 15) to which said second semiconductor chip is fixed;
- at least one bridge (13, at the middle) electrically connecting said first and said second semiconductor chip;

Art Unit: 2815

- external connecting electrodes (13, located at the out-side of the elements 19 and surrounding the elements 19) provided to surround areas where said first and said second semiconductor chip are located, at least a portion of the rear surface of them serving as an electrode to be externally connected (see Fig. 6);
- first metallic wires (18, located at the out-side of the element 19) which electrically connect said first and said second semiconductor chip to said external connecting electrodes, respectively;
- second metallic wires (18, at the middle) which electrically connect said first semiconductor chip, said at least one bridge and said second semiconductor chip; and
- insulating resin (20) which seals said first and said second semiconductor chip, said external connecting electrode, and said first and said second metallic wires,
- wherein said insulating resin (20) separates said first and second die pad, said at least one bridge and said external connecting electrodes from one another, and said second metallic wires are coupled to said first and said second semiconductor chip using a ball bond and coupled to said at least one bridge using a stitch bond.
- further comprising a plurality of recesses (at the places of the elements 13 and 19) in a rear surface of said insulating resin, the rear surface of said first and second die pad and said external connecting electrodes being exposed within said recesses, wherein the at least one bridge (13, at the middle) is exposed within at least one of the recesses.

Lin et al. does not disclose an insulating film on the rear surface of the at least one bridge and a rear surface of the bridge being recessed relative to the rear surface of the insulating resin.

Art Unit: 2815

Sawaya teaches in Fig. 13 a rear surface of at least one bridge (13B) being recessed relative to the rear surface of an insulating resin (15); and the rear surface of the at least one bridge (13B) being covered by an insulating film (14; column 5, line 20). It would have been obvious to one of ordinary skill in the art at the time when the invention was made to apply the insulating film coated bridge of Sawaya into the semiconductor device of Lin et al. as taught by Sawaya to reduce the length of the wirings and to reduce the impedance component and the electrical characteristic (column 7, lines 55 – 59).

Furthermore, as to the language on lines 4 ~ 5 from the bottom of claim 4, “said second metallic wires are coupled to said first and said second semiconductor chip using a ball bond and coupled to said bridge using a stitch bond”, even though product-by-process claim is limited by and defined by the process, determination of patentability is based upon the product itself. The patentability of a product does not depend on its method of production. If the product in product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product is made by a different process. In re Thorpe, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted). A “product by process” claim is directed to the product per se, no matter how actually made, In re Hirao, 190 USPQ 15 at 17 (footnote 3). See also In re Brown, 173 USPQ 685; In re Luck, 177 USPQ 523; In re Fessmann, 180 USPQ 324; In re Avery, 186 USPQ 116; In re Wertheim, 191 USPQ 90 (209 USPQ 254 does not deal with this issue); and In re Marosi et al., 218 USPQ 289 final product per se which must be determined in a “product by, all of” claim, and not the patentability of the process, and that an old or obvious product, whether claimed in “product by process” claims or not. Note that Applicant has the burden of proof in such cases, as the above caselaw makes clear.

Art Unit: 2815

Regarding claim 28, Lin et al. discloses in e.g., Fig. 3 the at least one bridge (13, at the middle) being arranged between said first and second semiconductor chips.

7. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al. and Sawaya as applied to claim 4 above, and further in view of Fjelstad (U.S. Pat. No. 6,001,671).

While Lin et al., as modified, does disclose a plurality of recesses in a rear surface of said insulating resin, however Lin et al. does not disclose the rear surface of the insulating resin protruding from the rear surface of the die pads and the external connecting electrodes. Fjelstad teaches in e.g., Fig. 2E a rear surface of an insulating resin (140 and 100'-polyimide) protruding from the rear surface of a die pad (115') and external connecting electrodes (110'). It would have been obvious to one of ordinary skill in the art at the time when the invention was made to further modify Lin et al. by forming the rear surface of the insulating resin to protrude from the rear surface of the die pads and the external connecting electrodes as taught by Fjelstad. The ordinary artisan would have been motivated to further modify Lin et al. in the manner described above for at least the purpose of protecting the circuits from moisture in the environment.

#### *Response to Arguments*

8. Applicant's arguments with respect to claim 4 have been considered but are moot in view of the new ground(s) of rejection by different interpretation of the previously applied reference.



*Conclusion*

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chris C. Chu whose telephone number is 571-272-1724. The examiner can normally be reached on 11:30 - 8:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on 571-272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

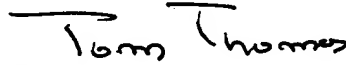
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

Art Unit: 2815

Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chris C. Chu  
Examiner  
Art Unit 2815

c.c.  
Tuesday, August 02, 2005

  
TOM THOMAS  
SUPERVISORY PATENT EXAMINER